(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 March 2001 (15.03.2001)

PCT

(10) International Publication Number
WO 01/17488 A1

(51) International Patent Classification[7]: A61K 7/032, 7/06, 7/48

(21) International Application Number: PCT/US00/24042

(22) International Filing Date:
1 September 2000 (01.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/389,499 3 September 1999 (03.09.1999) US

(71) Applicant *(for all designated States except US)*: L'OREAL SA [FR/FR]; 14, rue Royale, F-75008 Paris (FR).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: COLLIN, Nathalie [FR/FR]; 1, rue Michel Voisin, F-92330 Sceaux (FR). KANJI, Mohamed [US/US]; 111 Terminal Avenue, Clark, NJ 07066 (US). LAMPRECHT, William [US/US]; 111 Terminal Avenue, Clark, NJ 07066 (US). ORR, Carl [US/US]; 111 Terminal Avenue, Clark, NJ 07066 (US).

(74) Agents: GARRETT, Arthur, S. et al.; Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., 1300 I Street, N.W., Washington, DC 20005-3315 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*
— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/17488 A1

(54) Title: COSMETIC COMPOSITIONS CONTAINING SPECIFIC POLYSACCHARIDE RESINS

(57) Abstract: An embodiment of the present invention is a composition with enhanced film forming properties. The compositions of the present invention contain (a) at least one polysaccharide resin and (b) a film former other than said at least one polysaccharide resin. A cosmetic or pharmaceutical composition comprising the compositions of the present invention may be transfer-resistant, long wearing, and water resistant. Cosmetic and pharmaceutical compositions of the invention also may result in a flexible film that does not flake or crumble.

COSMETIC COMPOSITIONS CONTAINING SPECIFIC POLYSACCHARIDE RESINS

The present invention relates to a composition, in particular a cosmetic composition, with enhanced film forming and dispersion properties. The cosmetic compositions of the present invention contain at least one polysaccharide resin and can have one or more properties, such as transfer-resistance, long-wear, flexibility, and ease of application. The present invention also relates to cosmetic and pharmaceutical products containing this composition.

Many cosmetic compositions, including pigmented cosmetics such as foundations, concealers, mascaras, eyeliners, and sunscreens, leave soft oily films that can transfer quite easily or form brittle films that flake or crumble. In both cases, the result is less than optimal persistence of the composition and a need for regularly repeated application of the cosmetic composition. For example, some compositions are capable of becoming deposited, at least in part, on certain supports with which they are brought into contact, such as, for example, a glass, a cup, an item of clothing or the skin. On becoming deposited, the composition leaves a mark on the support.

There are several transfer-resistant cosmetic compositions that are known in the art. However, the majority of these compositions can still be improved. So-called "transfer-free" make-up compositions known in the art generally comprise, among their constituent fatty substances, volatile oils, in particular volatile silicone oils and/or volatile hydrocarbon oils. As a result, the majority of these transfer-resistant compositions do not possess good film forming properties. For example, many of these "transfer-free" compositions are tacky, thus, the application and spreadability of the compositions could still be improved.

One reason for poor film formation is that a "transfer-free" make-up composition can require the use of a complex composition in which the oils are partially replaced by volatile solvents which evaporate on contact with the skin, leaving a layer composed essentially of waxes and/or resins, pigments, fillers and actives. Apart from the preparation difficulties associated with the

use of volatile compounds, this solution can have the drawback of leading to a make-up effect of powdery and matte appearance.

Other compositions leave brittle films that flake and crumble following application. Supports for cosmetic compositions such as skin and hair naturally bend and flex. However, there are film formers used in the art that result in a hard or brittle film that does not bend or stretch once applied. The resulting formulations, therefore, especially when applied to shape or style, *e.g.*, hair or eyelashes, flake and fall apart because of their brittle nature.

The need therefore remains for stable cosmetic compositions comprising film formers that are transfer-resistant, flexible, can be used for shaping and contouring, and which also possess good cosmetic properties such as ease of application, smooth and consistent film formation, comfort, ease of make-up removal, and are non greasy, non tacky, and non runny during application. An objective of this invention is to provide cosmetic compositions containing as many of these properties as possible.

In addition to the limitations of many film formers, another problem prevalent in the preparation of formulations in the cosmetic and pharmaceutical industry is the dispersion of components which make up a composition. A great deal of time and energy is spent in an attempt to obtain an even distribution or dispersion of ingredients. A uniform dispersion of components that make up a cosmetic or pharmaceutical composition, including dispersion of pigments, can result in enhanced properties such as improved efficacy, brighter color, higher gloss, uniformity of batches, less clumping, and less energy required for mixing.

Sufficient pigment dispersion can thus improve the properties of color cosmetics. There are several products available in the art for use as pigment dispersants, including KAMA KM13, a polysaccharide resin available from KAMA International Corp., Duluth, GA. KM13 can lower the viscosity of a pigmented composition and improve the pigment wetting, thereby improving color, gloss, and ease of mixing. KM13 also is known to form a film that dries in air. However, polysaccharide resins are water soluble, a property that has

been considered by some to be undesirable for a film former used for transfer-resistant or long-wearing compositions.

Therefore, in addition to compositions containing improved film formers, there is also a need for compositions where the components are more readily and effectively dispersed. As noted above, the use of more effective dispersion aids should result in improved properties and more consistent cosmetic and pharmaceutical products.

To achieve these and other advantages, in whole or in part, the present invention is, in one embodiment, drawn to a composition comprising at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin present in a combined amount effective to impart at least one of the following properties to the composition. These properties include, but are not limited to, transfer-resistance for cosmetic compositions such as mascara, eyeliner, and sunscreens; flexible film formation for cosmetic compositions such as mascara, eyeliner, and sunscreens; control of the curling effect or lengthening effect of mascara on eyelashes; and increased UV light absorption for sunscreens. These properties will be discussed in greater detail below.

In another embodiment, the present invention relates to a method of forming a transfer-resistant film by applying to a keratinous substance at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin. Keratinous substances are defined herein as skin, hair, eyelashes, eyebrows, and nails. A method of forming a flexible, non-brittle film by applying to a keratinous substance at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin is also within the practice of the invention. In another aspect of the invention, a flexible film, which is also transfer-resistant, is formed.

In yet another embodiment, the present invention relates to a method of producing a curling or styling effect on keratinous fibers, by applying to these fibers a composition comprising at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin.

The present invention is also drawn to a method effective for controlling lengthening effect and/or the volume of a mascara product on the eyelashes. Specifically, a mascara composition comprising at least one polysaccharide resin, at least one film former other than said at least one polysaccharide resin, at least one volatile solvent and at least one spherical particle is applied in a layer-upon-layer fashion until a desired length or volume of eyelash is obtained.

In yet another embodiment, the present invention is drawn to a method for increasing the ultraviolet (UV) light adsorption properties of a sunscreen composition by including in the sunscreen composition at least one polysaccharide resin.

It is also an embodiment of the invention to use compositions comprising a polysaccharide resin and optionally at least one film former other than said at least one polysaccharide resin to disperse the components of a cosmetic or pharmaceutical composition, such components including, but not limited to, pigments and/or UV light dispersing compounds.

Reference will now be made in detail to embodiment(s) of the invention.

The present invention relates, *inter alia*, to a composition comprising at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin in a combined amount effective to impart at least one of certain properties to the composition. In a first embodiment, the inventive composition is in the form of a transfer-resistant cosmetic composition, in which the at least one polysaccharide resin and the at least one film former are present in a combined amount effective to impart transfer-resistant properties to the composition. The transfer-resistant cosmetic composition may be a mascara, an eyeliner, or a sunscreen composition. Each of these compositions will be discussed in further detail below. The transfer-resistant cosmetic composition may also be chosen from, but is not limited to, foundations, concealers, blush, eyeshadows, lipsticks, and nail enamels.

In addition to transfer-resistant cosmetic compositions, the present invention further relates to a method of forming a transfer-resistant film by applying to a keratinous substance at least one polysaccharide resin and at least one film former other than the at least one polysaccharide resin.

The present invention also relates to a cosmetic composition that forms a flexible film, where the composition comprises at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin present in a combined amount effective to impart flexibility to the film. In the context of the present invention, flexibility is defined as durability of a film when subjected to movement such as facial expressions, i.e., the films of this embodiment of the present invention resist flaking or becoming brittle. The flexible film-forming cosmetic composition may be, for example, a mascara, an eyeliner, or a sunscreen composition. The films formed by these embodiments of the inventive compositions contain at least one of the following properties:
good adherence to substrates, flexibility, good wearability, good drying time, non- tackiness, good retention, transfer-resistant properties, and/or low migration over time, among other properties.

The flexible film-forming cosmetic composition may also be chosen from, but is not limited to, foundations, concealers, blush, eyeshadows, lipsticks, and nail enamels.

Also encompassed by an embodiment of the present invention is a method of forming a flexible film by applying to a keratinous substance at least one polysaccharide resin and at least one film former other than the at least one polysaccharide resin.

Another embodiment of the present invention also encompasses a cosmetic composition that forms a film which is both transfer-resistant and flexible, where the composition comprises at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin in a combined amount effective to impart both transfer-resistant properties and flexibility to the film. The transfer-resistant, flexible film-forming cosmetic

composition may be, for example, a mascara, an eyeliner, a sunscreen, a foundation, a concealer, a blush, an eyeshadow, a lipstick, or a nail enamel.

In addition to cosmetic compositions that form a transfer-resistant flexible film, another embodiment of the present invention further relates to a method of forming a transfer-resistant flexible film by applying to a keratinous substance at least one polysaccharide resin and at least one film former other than the at least one polysaccharide resin.

Film formation occurs when the solvent evaporates at a rate that preferably allows a film to form continuously and substantially free from imperfections. The polysaccharide resins of the present invention are known in the art as film formers. However, the combination of at least one polysaccharide resin with at least one other film former, such as a polymer or a wax, can result in the synergistic effect of improved film forming properties including transfer and water resistance. At least one polysaccharide resin used alone, i.e., not in combination with another, different, film former, that imparts the desired transfer-resistant or film forming properties also constitutes an embodiment of the inventive composition.

The at least one polysaccharide resin and the at least one film former are present in a combined amount effective to impart at least one of the desired properties to the inventive composition, i.e., the amount necessary to obtain a desired effect, such as transfer resistance, flexible film formation, control of the curling effect or lengthening effect of mascara, and increased UV light absorption for sunscreens.

One of skill in the art can determine routinely the effective amount of polysaccharide resin and other film former to use in the inventive compositions depending on the application and the properties desired. One of skill in the art will also be able to determine routinely the amount of polysaccharide resin film former, other film former, and other ingredients needed to obtain a stable cosmetic or pharmaceutical product, depending on the application. As defined herein, a stable cosmetic or pharmaceutical product is one of sufficient stability to enable effective commercialization of the cosmetic or pharmaceutical product.

Overall, the compositions of the invention may provide at least one of excellent transfer resistance, adherence, flexibility and long wearing properties, shaping or contouring properties, and ingredient dispersing properties, in a broad range of applications. These inventive compositions may be in the form of, but are not limited to, pigmented cosmetics, including foundations, concealers, blush, mascaras, eyeliners, lipsticks, eyeshadows, and nail enamels or varnishes, hair sprays, gels and mousses, sunscreen lotions, moisturizing lotions, and lotions, oils or creams with active ingredients or fragrances.

The compositions of the present invention can particularly be useful in any cosmetic or pharmaceutical application which relates to formation of a flexible film that adheres to a keratinous substance. Further, the compositions of the invention can be used to hold or bind topical coatings, active ingredients and functional ingredients onto a substrate. The active or functional ingredients may include pigments, UV filters, moisturizing agents, fragrance, pharmaceutical agents and other active or functional ingredients known in the cosmetic or pharmaceutical arts.

In another embodiment of the invention, the compositions of the present invention comprising at least one polysaccharide resin and at least one additional film former are effective in waterproofing. The compositions may therefore minimize washoff of the active or functional ingredients. The compositions may also retard dehydration of the skin by forming an occlusive film and reducing trans-epidermal water loss. In one embodiment, the compositions can provide a barrier between the skin and the environment which entraps the active and/or functional ingredients. The barrier formed by said compositions may boost the activity of the functional ingredients resulting in increased sun protection factor (SPF) and UV light protection and/or block the effect of the humidity and the environment.

In another embodiment, the at least one polysaccharide resin of the present invention comprises numerous hydroxyl groups and hydrophobic groups. The polysaccharide resin can be in the form of colloidal suspensions of fine, highly modified particles such as starch particles. The fine particles

may vary in size, and include particles with a diameter of 10 microns or less. In a further embodiment, the transfer-resistant and flexible film forming compositions of the present invention comprise:

(1) at least one polysaccharide resin comprised of numerous hydroxyl groups and hydrophobic groups which is in the form of a colloidal suspension of fine, highly modified starch particles and

(2) at least one film former other than said at least one polysaccharide resin, wherein (1) and (2) are present in a combined amount effective to impart transfer-resistant and/or flexible film forming properties to the composition.

In yet another embodiment, the polysaccharide resin of the present invention is chosen from the polysaccharide resins available from KAMA, International Corp., Duluth, GA. For example, polysaccharide resin KM13 is a highly modified, colloidal suspension in water of finely divided starch particles with a diameter of less than 10 microns. KM13 is a co-reactive resin which will form hydrogen bonds with other resins. KM13 contains numerous hydroxyl groups which contribute to the wetting of pigments in aqueous systems and hydrophobic groups that permit acceptance in solvent based systems without pigment flocculation or flotation.

Polysaccharide resins are water soluble and therefore a polysaccharide film former may be formulated by dissolving the polysaccharide resin in an aqueous system. In another embodiment, the polysaccharide resin may be added to other solvent based systems by dispersing into the solvent system a polysaccharide resin that has been previously dissolved in water. The compositions of the present invention including at least one polysaccharide resin and at least one film former other than the polysaccharide resin may also be utilized in water-in-oil or oil-in-water emulsions. The polysaccharide resin film formers and the film formers other than the polysaccharide resins may be contained in either the water phase or in the oil phase or both. In an embodiment, at least one of the polysaccharide resin film formers is in the water phase and at least one of the other, i.e., non-polysaccharide resin, film formers is in the oil phase.

In other embodiments of the invention, at least one of the other film formers may be in the oil phase, the water phase, or there may be at least one of the other film formers in each of the water and oil phases.

A person skilled in the art will know how to formulate and prepare a composition which has the desired properties taking into account the compatibility of the materials. One of ordinary skill in the art will be able to determine the solubility parameters and choose a solvent or aqueous based system based on the at least one polysaccharide resin and the at least one other film former chosen for the envisaged application. The polysaccharide film former and non-polysaccharide film former can be compatible with the other raw materials in the formulation.

Depending on the application, the concentration of polysaccharide resin in the inventive composition may vary considerably. One of skill in the art will be able to determine routinely the preferred concentration of polysaccharide resin depending on the application and the properties desired. In one representative embodiment, the compositions of the present invention comprise a polysaccharide resin such as KM13 present in amounts of from 1 % to 50 % concentration by weight relative to the weight of the total composition. In another embodiment the polysaccharide resin is present in amounts of from 5 % to 40 % concentration by weight. For example, for cosmetic foundations, the polysaccharide resin may be used in an amount of from 1 % to 50 % by weight, and also from 1 % to 20 % by weight. For eyeliner formulations, the at least one polysaccharide resin film former may vary from 1 % to 30 % by weight, and also from 2 % to 20 % by weight. For mascara formulations, the at least one polysaccharide resin film former may vary from 0.5 % to 50 % by weight, and also from 1 % to 20 % by weight.

The at least one film former other than the at least one polysaccharide resin that may be used in the practice of the invention may be chosen from, but is not limited to, celluloses and modified celluloses such as hydroxyethylcellulose; di-block, tri-block or radial block copolymer film formers such as KRATON® film formers; vinylpyrrolidone/vinyl acetate

(PVP/VA) copolymers such as the Luviskol VA grades (all ranges) from BASF® Corporation and the PVP/VA series from ISP; acrylic fluorinated emulsion film formers including Foraperle® film formers such as Foraperle® 303 D from Elf Atochem, although Foraperle® may not be preferable for some cosmetic formulations; GANEX® copolymers such as Butylated PVP, PVP/Hexadecene copolymer, PVP/ Eicosene copolymer or tricontanyl; Poly (vinylpyrrolidone/diethylaminoethyl methacrylate) or PVP/Dimethylaminoethylmethacrylate copolymers such as Copolymer 845; Resin ACO-5014 (Imidized IB/MA copolymer); other PVP based polymers and copolymers; silicone gums; cyclomethicone and dimethicone crosspolymers; trimethyl siloxysilicates such as SR 1000, SS4230, or SS4267 available from GE Silicones; alkyl cycloalkylacrylate copolymers; Mexomere® film formers and other allyl stearate/vinyl acetate copolymers (allyl stearate/VA copolymers); Polyolprepolymers such as PPG-12/SMDI copolymer and Poly(oxy-1,2-ethanediyl) α-hydro-ω-hydroxy-polymer with 1,1'-methylene-bis-(4-isocyanatocyclohexane) available from Barnet; Avalure® AC Polymers (Acrylates Copolymer) and Avalure® UR polymers (Polyurethane Dispersions), available from BFGoodrich; and other film formers disclosed in the *International Cosmetic Dictionary and Handbook Vol. 2* (7th ed. 1997), more particularly the film formers disclosed on pages 1636-1638. The disclosure of the *International Cosmetic Dictionary and Handbook Vol. 2*, pages 1636-1638, is hereby incorporated by reference.

Additional film formers which also may be used within the framework of the invention include any film formers known in the art such as: PVP, acrylates, and urethanes; synthetic polycondensate polymers, synthetic free-radical polymers, or synthetic ionic polymers; polymers of natural origin such as wheat protein film formers and mixtures thereof or any other film formers known within the practice of the cosmetic and pharmaceutical arts which one skilled in the art may determine to be compatible.

The other, i.e., non-polysaccharide resin, film former may improve smoothness or spreadability, water-resistance, transfer resistance properties, flexibility, or other cosmetic or pharmaceutical properties desired

by one of skill in the art. Other film formers include hydroxyethylcelluloses, gum arabics polyvinylpyrrolidones, and hydrolyzed wheat proteins. The polyvinylpyrrolidones may be chosen from PVPs, PVP/Eicosene copolymers and PVP/Hexadecene copolymers.

The concentration of the non-polysaccharide resin film formers may be determined by one of skill in the art and may vary considerably based on the application. For example, for cosmetic emulsions, the at least one non-polysaccharide film former is used in an amount from 1 % to 10 % by weight relative to the weight of the total composition, and also from 1 % to 5 % by weight. For eyeliner formulations, the at least one non- polysaccharide film former is used in an amount from 0.1 % to 10 % by weight, also from 1 % to 5 % by weight. For mascara formulations, the at least one non-polysaccharide film former is used in an amount from 0.1 % to 10 % by weight, also from 1 % to 5 % by weight.

Other compositions known in the art that are intended to leave a film on keratinous fibers may also be added to the compositions of the invention, including emollients and other ingredients usually employed in the field envisaged. These added ingredients may include gels, oils, waxes, preservatives, thickening agents, solvents, surfactants, emollients and other ingredients that when incorporated into the formulation stay on top of the skin and do not strongly adhere to the substrate. Characteristics of some of these materials may include an oily feeling and increased spreadability, as observed with some esters and organic sunscreens. In embodiments where these materials are added to the formulations of the invention to enhance the spreadability and the emollience of the product, however, it is preferred that the above materials be present in low enough concentrations for the formulation to retain its transfer resistance and flexible film forming properties. The choice of polysaccharide resins, additional film formers and their concentrations may also be adjusted to vary other cosmetic properties such as shaping or contouring properties and ingredient dispersion effects, both of which are discussed below.

Emollients that may be used in the compositions of the invention include glycerin, propylene glycol, cyclomethicone, dimethicone, and emollients and other similar ingredients disclosed in the *International Cosmetic Dictionary and Handbook Vol. 2* (7th ed. 1997), more particularly the emollients disclosed on pages 1656-1661. The disclosure of the *International Cosmetic Dictionary and Handbook Vol. 2*, pages 1656-1661, is hereby incorporated by reference. In an embodiment, emollients are present at a concentration of about 0.1 % to about 20 % by weight relative to the weight of the total composition.

The compositions of the invention may further include formulation aids which are usually employed in the field of application envisaged. The formulation aids used in the present invention can be, but are not limited to, fatty substances. Useful fatty substances include, but are not limited to, organic and organosilicone emulsifiers for water-in-oil systems. Examples of organic emulsifiers include any ethoxylated surfactants known in the art such as Polysorbate-20, Laureth-7, Laureth-4, Sepigel 305 available from SEPPIC and other similar ingredients disclosed in the *International Cosmetic Dictionary and Handbook Vol. 2* (7th ed. 1997), more particularly the emulsifiers disclosed on pages 1679-1687. The disclosure of the *International Cosmetic Dictionary and Handbook Vol. 2*, pages 1679-1687, is hereby incorporated by reference. Examples of organosilicone emulsifiers include cetyl dimethicone copolyol-polyglyceryl-4-isostearate-hexylaurate (ABIL WE 09) available from Goldschmidt Chemical Corporation, Cetyl Dimethicone Copolyol (ABIL® EM 90), (ABIL® EM 97), Laurylmethicone Copolyol (5200), Cyclomethicone (and) Dimethicone Copolyol (DC 5225 C and DC 3225 C) available from GE Silicones, Cyclopentasiloxane & Dimethicone Copolyol (GE SF 1528) or any other formulation aids known by one of skill in the art. Other fatty substances useful as formulation aids include but are not limited to, silicones in esterified or unesterified liquid form or in esterified solid form, such as behenate dimethicone; and non-silicone fatty substances including oils such as vegetable and mineral oil; animal and/or synthetic waxes such as

beeswax, parafin, rice bran wax, candelilla wax, carnauba wax and derivatives thereof; and hydrocarbon gels or bentone type gels, such as Gel SS71, Gel EA2786, Quaternium-18 Bentonite, 38 CE, Gel ISD V or Gel ISD. In one embodiment, formulation aids are present in amounts from about 0.1 % to about 25 % concentration by weight relative to the weight of the total composition.

These substances may be selected variously by the person skilled in the art in order to prepare a composition which has the desired properties, for example, consistency or texture. In particular, the composition according to the invention may include at least one of the above-mentioned waxes, so as to ensure a good mechanical strength, especially when the composition is in the form of a stick.

Plasticizers may also be added to the compositions to improve the flexibility and shaping properties of the resulting formulation. Plasticizers are materials which soften synthetic polymers. They are frequently required to avoid brittleness and cracking of film formers. One skilled in the art may routinely vary the amount of plasticizer desired based on the properties desired and the application envisaged. Plasticizers useful in the practice of the invention include lecithin, polysorbates, dimethicone copolyol, glycols, citrate esters, glycerin, dimethicone, and other similar ingredients disclosed in the *International Cosmetic Dictionary and Handbook Vol. 2* (7th ed. 1997), more particularly the plasticizers disclosed on page 1654. The disclosure of the *International Cosmetic Dictionary and Handbook Vol. 2*, page 1654, is hereby incorporated by reference.

In pigmented products, the amount of polysaccharide resins and additional film formers can be adjusted for best adherence to the skin or hair and water resistance. An important consideration is the ratio of pigments to the amount of film formers. A pigment should be understood to mean inorganic or organic, white or colored particles. Representative pigments that may be used in the practice of the invention include carbon black, titanium dioxide, D & C Red No. 7 Calcium Lake, D & C Red No. 21 Aluminum Lake, Iron Oxides, FD & C Yellow No. 5 Aluminum Lake, FD & C

Blue no. 1 Aluminum Lake and any other pigment or treated pigment known in the cosmetic arts. The use of the compositions of the present invention in pigmented products is especially preferred because of the inherent pigment dispersing properties of polysaccharide resins.

Fillers and mothers-of-pearl may also be added to said formulations to modify the texture of the composition and the matteness/gloss effect. Fillers should be understood to mean lamellar or non-lamellar, inorganic or synthetic, colorless or white particles. Mothers-of-pearl should be understood to mean irridescent particles produced especially by certain mollusks in their shell or else synthesized. Pearling agents that may be used in the practice of the invention include mica, iron oxides, titanium dioxide and any other pearling agent known in the cosmetic arts.

It is also possible to add to the composition of the invention any customary additive from the field of compositions to be applied in any cosmetic formulation including cosmetic foundations, eyeliners, lipsticks, mascaras, eyeshadows, concealers, lotions, nail enamels, or any other mentioned applications of the invention, such additives being chosen from, but not limited to: thickening agents, such as clays, or organoclays, silicas, or cellulose derivatives; hectorites; stabilizing agents; synthetic polymers such as an acrylic polymer or an associative polymer comprising polyurethane; liposoluble polymers; gums and in particular xanthan gum; spreading agents; dispersants; preservatives, in particular water-soluble preservatives; antifoaming agents; wetting agents; chelators such as EDTA and salts thereof; UV-screening agents; perfumes; fillers; antioxidants; essential oils; cosmetic or pharmaceutical active agents; moisturizers; vitamins and derivatives thereof; biological materials and derivatives thereof.

The person skilled in the art will of course take care to choose the optional additional compounds and/or their quantity in such a way that the advantageous properties of the composition according to the invention are not, or are substantially not, impaired by the envisaged addition.

Another subject of the invention is mascara. Transfer-resistant and flexible-film forming mascaras have been discussed. Mascara employing the composition of the invention may also have increased stability, better adherence to keratin fibers, greater wear resistance, improved water resistance, and improved cosmetic properties. Further, the compositions of the present invention may be used to shape and contour keratinous fibers by forming a film which can be shaped to a desired configuration or contour upon application and consequently holds its shape once applied. For example, the compositions of the present invention can be used to shape, contour, and/or curl keratinous fibers such as eyelashes. The contoured or curled eyelashes retain the desired shape following application of these compositions, in part because the resulting film that is formed adheres to the lashes and maintains the lashes in a desired shape. The film is flexible and may also be water resistant.

The use of a polysaccharide resin, *i.e.*, KAMA KM 13, in a mascara composition at a concentration of 4% relative to the total weight of the composition is disclosed in PCT/US98/10617. The inventors have discovered, however, that a curling effect is observed wherein the polysaccharide resin is present in an amount greater than or equal to 5 % relative to the total weight of the composition, preferably in an amount greater than or equal to 10 %. The curling effect is a surprising result not observed using most conventional film formers found in the art. For example, the polysaccharide resin, KAMA KM 13, was combined in a mascara formulation with a hydroxyethylcellulose film former. A curling effect was observed with as little as 10% KM 13 present in the mascara formulation. The same formulation, without the KM 13, demonstrated no curling effect. Accordingly, in one embodiment, a composition of the invention which gives a curling effect contains at least one polysaccharide resin in amounts ranging from 5 % to 50 % relative to the total weight of the composition.

Thus, within the practice of the invention is a method of producing a curling effect on keratinous fibers, such as eyelashes, comprising applying a

composition comprising at least one polysaccharide resin and at least one film former other than said at least one polysaccharide resin to a keratinous fiber in a curling motion. If shaping or contouring in other than a curled shape is desired, a different motion for application may be required.

The application of the compositions of the invention may be repeated to enhance the desired shape or effect. Most mascara compositions, however, cannot be applied in a layer upon layer manner. In other words, traditionally one has not been able to control the lengthening effect of mascara on the eyelashes by applying layer on top of layer of mascara.

Thus, in another embodiment of the present invention, the compositions of the invention may be used to control the extending or lengthening effect on keratinous fibers such as eyelashes. The at least one film former other than said at least one polysaccharide resin enhances the transfer-resistance effect of the compositions. Such compositions also contain volatile solvents and/or hard spherical particles, both of which are discussed further below, to aid in repeated application of the mascara to keratinous fibers.

Accordingly, an embodiment of the invention is drawn to a mascara composition comprising at least one polysaccharide resin, at least one film former other than the polysaccharide resin, at least one volatile solvent, and at least one spherical particle. The ingredients are present in a combined amount effective for controlling the lengthening effect of mascara on keratinous fibers. Such a lengthening mascara formulation can be used for layer upon layer growth of the applied mascara. A mascara in which the lengthening effect on the resulting eyelash can be controlled by the amount of mascara formulation applied or the number of applications of the mascara formulation is also within the scope of the invention.

Therefore, in another embodiment, the present invention relates to a method of controlling the lengthening effect of a mascara product on an eyelash by applying in a layer upon layer manner to said eyelash a composition comprising at least one polysaccharide resin, at least one film former other than said at least one polysaccharide resin, at least one volatile

solvent, and at least one spherical particle, wherein the composition is applied until the desired lengthening or volume effect is achieved.

Volatile solvents are used in the lengthening mascara formulation to aid drying time and allow for quick re-application. Volatile solvents within the practice of the invention include but are not limited to, alcohols such as ethanol, silicones, petroleum distillates, and isoparaffins.

Spherical particles are used in the lengthening mascara formulation to enhance a smooth feeling and the spread of a composition onto keratinous fibers or to aid in the repeated application of a formulation as when a composition is applied in a layer upon layer manner. Spherical compounds within the practice of the invention include polyurethanes such as BPD 500, nylon 12, silica, polymethyl methacrylates and other acrylates or methacrylates and their esters, and other microspheres.

Use of the pigment dispersing properties of polysaccharide resins is also within the practice of the invention. For example, the polysaccharide resins of the present invention may be used to improve the dispersion and uniformity of other ingredients in a cosmetic or pharmaceutical product and therefore provide greater efficacy of the active ingredients. Not to be limited as to theory, improved dispersion may lead to more uniform coverage of the active ingredients and therefore higher efficacy of the active ingredients.

For example, the compositions described may be used to improve the dispersion of sunscreens and UV absorbers in a sunscreen formulation and subsequently increase the UV absorption properties or increase the SPF per amount of UV absorbing agent present in a formulation. Additionally, due to the dispersing properties of the polysaccharide resins, the UV absorbing effect of a composition may be more uniform. In one embodiment, the improved dispersion of components results in improved properties such as efficacy, brighter color, higher gloss, uniformity of batches, less clumping, and less energy required for mixing.

Thus, within the practice of the invention is a method of increasing the UV light absorption properties of a sunscreen composition, comprising

the addition to the sunscreen composition of at least one polysaccharide resin.

The packaging and application device for any subject of the invention may be chosen and manufactured by persons skilled in the art on the basis of their general knowledge, and adapted according to the nature of the composition to be packaged. Indeed, the type of device to be used may be in particular linked to the consistency of the composition, specifically to its viscosity; it may also depend on the nature of the constituents present in the composition, such as the presence of volatile compounds.

The invention will be further clarified by the following examples, which are intended to be illustrative of the invention, but not limiting thereof.

Examples

Example 1: Sunscreen composition

A polysaccharide resin, KAMA KM 13, was added to a sunscreen composition containing other film formers such as PVP/Eicosene copolymer and Acrylates/C10-30 Allyl Acrylate Crosspolymer in order to improve the dispersion of the UV absorbing agent, TiO_2. The resulting sunscreen composition was an oil-in-water emulsion.

Sunscreen		g
A1	Stearic Acid	1
	Glyceryl Stearate/PEG-100 Stearate	1
	Isopropyl Palmitate	12
	Dimethicone	1
	Phenoxyethanol	0.7
	Propylparaben	0.05
	PVP/Eicosene copolymer	1
A2	Triethanolamine	0.3
B1	Glycerin	4
	Propylene Glycol	4
	Methylparaben	0.15
B2	TiO_2	10
	KAMA-KM13	1

C	Xanthan Gum	0.1
D	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.2
	Isopropyl Palmitate	2.5
E	Triethanolamine	0.2
	Water	1
F	Cyclopentasiloxane	7
G	Water	qsp 100

Procedure:

Ingredients in phase A1 were mixed together. Phase A2 was added to A1 and the resulting mixture was heated to about 80°C. In a separate container B1 was mixed with water and heated to about 80°C. The two phases were blended with intense mixing for several minutes until homogeneous. Phase B2 was blended and then added to the previous mix. The resulting mixture was cooled to room temperature with constant mixing and the rest of the ingredients were added. Water was added to bring to volume.

Example 2: Curling effect mascara

KAMA KM 13 was added to a mascara composition in the form of an oil-in-water emulsion. The composition also contained the additional film formers hydrolyzed wheat protein and hydroxyethylcellulose. Upon application to eyelashes, a curling effect was observed. The curling effect was enhanced by the application process, *i.e.*, the curling motion of the mascara application.

Oil-in-water emulsion mascara		%
A1	Natural waxes	23
A2	Black iron oxide	8
A3	Triethanolamine Stearate (C16/C18 50/50)	7.85
B1	Water	qsp 100
B2	Hydroxyethylcellulose	0.2
B3	Gum arabic	1.5
C	Preservatives	qs
D	Anti-foaming agent	0.12

E	KAMA KM 13	10
F	Hydrolyzed wheat protein	0.2

Procedure:

Phase A was combined by blending A1, A2, and A3 and heating to 85-90°C. The phase was mixed until uniform. Separately B1 was heated to 85-90°C while stirred and B2 and B3 were sprinkled in until uniform. Phase A and Phase B were combined and mixed intensively while the temperature was maintained at 85°C until uniform. C was then added to the combined A + B phase and cooled to 30°C while mixing. Ingredients D through F were added while mixing.

Example 3: Shaping and Contouring Mascara

KAMA KM 13 was added to a transparent mascara composition containing the film former hydroxyethylcellulose. A shaping or contouring effect was observed upon application to eyelashes. The shaping or contouring was controlled by the application process.

Transparent mascara		%
A1	Water	qsp 100
A2	Hydroxyethylcellulose	0.1
A3	CARBOPOL	1.32
A4	Triethanolamine	1.32
B	KAMA KM 13	33
C	Preservatives	qsp

Procedure:

A1 was heated to 85°C while stirring. A2 was added slowly in the vortex created by the mixer followed by the addition of A3. A4 was added and mixed until uniform. The mixture was cooled to room temperature and B and C were added. The mixture was stirred for 10 minutes until uniform.

Example 4: Curling effect mascara

KAMA KM 13 was added to a wax microdispersion mascara formulation. The composition also contained the additional film former hydroxyethylcellulose. Upon application to eyelashes, a curling effect was observed. The curling effect was also enhanced by the application process.

Wax microdispersion mascara		%
A1	Carnauba wax	22

	A2	Glyceryl oxyethylene (30 OE) monostearate	5.5
	A3	Water	45
	B	Sodium hydroxide	0.05
	C	Black iron oxide	5
	D	Gum arabic	3.3
	E	Hydroxyethylcellulose	0.55
	F	KAMA KM 13	10
	G	Preservatives	qs
	H	Water	qsp 100

Procedure:

Carnauba wax, glyceryl oxyethylene (30 OE) monostearate, and water were prepared as described in U.S. Patent 5,858,338. The resulting wax microdispersion was combined at room temperature with B and C and homogenized until uniform. D and E were sprinkled slowly in the agitated mixture until uniform. F, G and H were then added to the composition. The mixing was continued until uniform.

Example 5: Waterproof mascara

A mascara formulation that contained the polysaccharide resin, KAMA KM 13, and the additional film former Allyl Stearate/VA Copolymer, was prepared. The following formulation demonstrated that a water soluble, polysaccharide film former is effective in preparing a water resistant and transfer-resistant mascara composition.

Waterproof Mascara			%
	A1	Petroleum Distillates	50.59
	2	Pigment &/or Carbon Black	6.00
	B1	Bentone	5.54
	2	Isoparaffin	10.50
	C1	Rice Starch	1.00
	D1	Propylene Carbonate	1.82
	E1	Waxes	15.12
	2	Allyl Stearate/VA Copolymer	2.43
	3	Polyvinyl Laurate	1.00

4	Microspheres	1.00
F1	KAMA KM 13	2.50
2	Water	2.49
3	Preservatives	0.01

Procedure:

The A ingredients were combined and homogenized for 1 hour. To the mixture of A ingredients, the B ingredients were added and homogenized for 10 minutes followed by addition of C1. The entire mixture was homogenized for another 10 minutes at which time D1 was added and the mixture was homogenized for an additional 15 minutes. The E ingredients were heated to 90-95°C, added to the mixture above, the result of which was homogenized for 30 minutes while maintaining the formulation at 60-65°C. Finally, the F ingredients were added and the final formulation was homogenized for 3 minutes and cooled to 30-32°C while stirring.

Example 6: Controlled Application Mascara

A mascara composition that was effective for the controlled application of mascara to eyelashes was formulated as described below. The mascara composition described was applied in a layer upon layer fashion until a desired lengthening or volume of eyelash was obtained. The controlled volume or lengthening mascara contained the polysaccharide resin, KAMA KM 13, and the additional film formers PVP/Hexadecene copolymer and PVP/Eicosene copolymer.

Controlled Application Mascara		%
A1	Waxes	15.1
2	Stearic Acid	4.70
3	Preservatives	0.75
4	PVP/Eicosene Copolymer	1.00
B1	Water	35.70
2	Aqueous Thickener	0.40
3	KAMA KM 13	1.25
4	Lecithin	0.15
5	Pigment &/or Carbon Black	9.00

6	PVP/Hexadecene Copolymer	1.00
7	Glycols	3.50
8	Triethanolamine	2.35
C1	Anti-foaming agent	0.10
D1	Volatile Silicone	3.00
2	Silicone Gum	2.50
3	Filler	4.50
E1	Polyurethane	10.00
F	Alcohol	5.00

Procedure

The A ingredients were combined, heated to 85-90°C, and mixed until uniform. In a separate beaker, B1 was heated to 40-45°C at which time B2 was slowly added into the vortex. The mixture of B1 and B2 was heated to 85°C, ingredients B3 through B8 were added and the resulting mixture was heated to 85°C and milled for 30 minutes.

The B ingredients were added to the A ingredients and milled for an additional 10 minutes. C was then added to the mixture of A and B and the formulation was cooled to 40-45°C while mixing. In a separate beaker, the D ingredients were combined, mixed until uniform, and added to the mixture of A, B, and C ingredients. The formulation was mixed until uniform. Finally E_1 was added, mixed until uniform and cooled until 30°C and which time F was added and the final formulation was mixed for 15 minutes.

Example 7: Foundation

A polysaccharide resin, KAMA KM 13, was added to a cosmetic foundation composition containing the additional film former cyclomethicone and dimethicone crosspolymer.

Cosmetic Foundation		%
A1	Water	25.00
2	Chelator	0.10
3	Emulsifier	0.40
B1	Water	15.00

	2	Preservative	0.30
	3	KAMA KM 13	2.00
	4	Polysorbate 20	0.25
	5	Pigments	12.50
C1		Emulsifier	0.70
	2	Fillers	10.00
D1		Humectant	7.00
	2	Thickener	0.15
E1		Silicone oil phase	13.00
	2	Emulsifier	1.10
	3	Preservative	0.10
	4	Cyclomethicone & Dimethicone Crosspolymer	5.00
	5	Moisturizing agent	5.00
F		Water	qsp 100

Procedure

In a mixing vessel equipped with a propeller type mixer, phase A was blended and heated to 70°C. Phase B was mixed in a separate container and heated to 70°C with constant mixing until uniform. Phase B was added to phase A. While mixing phase A and B with the propeller type mixer, phase C followed by phase D were added. The resulting composition was added to phase E at 70°C and homogenized until uniform. F was added and the composition was homogenized until uniform and swept cool.

WE CLAIM:

1. A cosmetic composition comprising:

at least one polysaccharide resin, and

at least one film former other than said at least one polysaccharide resin,

wherein said at least one polysaccharide resin is present in an amount greater than or equal to 5% by weight relative to the total weight of the composition, and

wherein said at least one polysaccharide resin and said at least one film former are present in an combined amount effective to impart transfer-resistant properties to said composition

2. A cosmetic composition according to claim 1, wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

3. A cosmetic composition according to claim 2, wherein said highly modified starch particles have a diameter of 10 microns or less.

4. A cosmetic composition according to claim 1, wherein said at least one film former other than said at least one polysaccharide resin is chosen from gum arabics, hydroxyethylcelluloses, polyvinylpyrrolidones, and hydrolyzed wheat proteins.

5. A cosmetic composition according to claim 4, wherein said polyvinylpyrrolidones are chosen from PVP, PVP/Eicosene copolymers and PVP/hexadecene copolymers.

6. A cosmetic composition according to claim 1, further comprising at least one plasticizer.

7. A cosmetic composition according to claim 6, wherein said plasticizer is chosen from lecithins, polysorbates, dimethicone copolyols, glycols, citrate esters, and glycerin.

8. A transfer-resistant mascara product comprising:

at least one polysaccharide resin, and

at least one film former other than said at least one polysaccharide resin,

wherein said at least one polysaccharide resin is present in an amount greater than or equal to 5% by weight relative to the total weight of the composition, and

wherein said at least one polysaccharide resin and said at least one film former are present in an combined amount effective to impart transfer-resistant properties to said mascara product.

9. A transfer-resistant mascara product according to claim 8, wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

10. A transfer-resistant mascara product according to claim 9, wherein said highly modified starch particles have a diameter of 10 microns or less.

11. A transfer-resistant mascara product according to claim 8, wherein said at least one film former other than said at least one polysaccharide resin is chosen from gum arabics, hydroxyethylcelluloses, polyvinylpyrrolidones, and hydrolyzed wheat proteins.

12. A transfer-resistant mascara product according to claim 11, wherein said polyvinylpyrrolidones are chosen from PVP, PVP/Eicosene copolymers and PVP/hexadecene copolymers.

13. A transfer-resistant mascara product according to claim 8, further comprising carbon black.

14. A transfer-resistant mascara product according to claim 8, further comprising at least one plasticizer.

15. A transfer-resistant mascara product according to claim 14, wherein said plasticizer is chosen from lecithins, polysorbates, dimethicone copolyols, glycols, citrate esters, and glycerin.

16. A method of forming a transfer-resistant film comprising applying to a keratinous substance a composition comprising

at least one polysaccharide resin, and

at least one film former other than said at least one polysaccharide resin.

17. A method of forming a transfer-resistant film according to claim 16 wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

18. A method of forming a transfer-resistant film according to claim 17 wherein said highly modified starch particles have a diameter of 10 microns or less.

19. A method of forming a transfer-resistant film according to claim 16 wherein said at least one film former other than said at least one polysaccharide resin is chosen from gum arabics, hydroxyethylcelluloses, polyvinylpyrrolidones, and hydrolyzed wheat proteins.

20. A method of forming a transfer-resistant film according to claim 19 wherein said polyvinylpyrrolidones are chosen from PVP, PVP/Eicosene copolymers and PVP/hexadecene copolymers.

21. A method of forming a flexible film comprising applying to a keratinous substance a composition comprising

at least one polysaccharide resin, and

at least one film former other than said at least one polysaccharide resin.

22. A method of forming a flexible film according to claim 21 wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

23. A method of forming a flexible film according to claim 22 wherein said highly modified starch particles have a diameter of 10 microns or less.

24. A method of forming a flexible film according to claim 21 wherein said at least one film former other than said at least one polysaccharide resin is chosen from gum arabics, hydroxyethylcelluloses, polyvinylpyrrolidones, and hydrolyzed wheat proteins.

25. A method of forming a flexible film according to claim 24 wherein said polyvinylpyrrolidones are chosen from PVP, PVP/Eicosene copolymers and PVP/hexadecene copolymers.

26. A method of forming a transfer-resistant flexible film comprising applying to a keratinous substance a composition comprising

at least one polysaccharide resin, and

at least one film former other than said at least one polysaccharide resin.

27. A method of forming a transfer-resistant flexible film according to claim 26 wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

28. A method of forming a transfer-resistant flexible film according to claim 27 wherein said highly modified starch particles have a diameter of 10 microns or less.

29. A method of forming a transfer-resistant flexible film according to claim 26 wherein said at least one film former other than said at least one polysaccharide resin is chosen from gum arabics, hydroxyethylcelluloses, polyvinylpyrrolidones, and hydrolyzed wheat proteins.

30. A method of forming a transfer-resistant flexible film according to claim 29 wherein said polyvinylpyrrolidones are chosen from PVP, PVP/Eicosene copolymers and PVP/hexadecene copolymers.

31. A method of producing a curling effect on a keratinous fiber comprising applying to said keratinous fibers in a curling motion a composition comprising

at least one polysaccharide resin, and

at least one film former other than said at least one polysaccharide resin.

32. A method of producing a curling effect on a keratinous fiber according to claim 31 wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

33. A method of producing a curling effect on a keratinous fiber according to claim 32 wherein said highly modified starch particles have a diameter of 10 microns or less.

34. A method of producing a curling effect on a keratinous fiber according to claim 31 wherein said at least one polysaccharide resin is

present in an amount greater than or equal to 5% relative to the total weight of the composition.

35. A method of producing a curling effect on a keratinous fiber according to claim 34 wherein said at least one polysaccharide resin is present in an amount greater than or equal to 10% relative to the total weight of the composition.

36. A method of producing a curling effect on a keratinous fiber according to claim 31 wherein said at least one film former other than said at least one polysaccharide resin is chosen from gum arabics, hydroxyethylcelluloses, polyvinylpyrrolidones, and hydrolyzed wheat proteins.

37. A method of producing a curling effect on a keratinous fiber according to claim 36 wherein said polyvinylpyrrolidones are chosen from PVP, PVP/Eicosene copolymers and PVP/hexadecene copolymers.

38. A method of increasing the UV light absorption properties of a sunscreen composition comprising the addition to said composition of at least one polysaccharide resin.

39. A method of increasing the UV light absorption properties of a sunscreen composition according to claim 38 wherein said at least one polysaccharide resin is a colloidal suspension of highly modified starch particles.

40. A method of increasing the UV light absorption properties of a sunscreen composition according to claim 39 wherein said highly modified starch particles have a diameter of 10 microns or less.

41. A mascara composition comprising the following ingredients:

at least one polysaccharide resin,

at least one film former other than said at least one polysaccharide resin,

at least one volatile solvent, and

at least one spherical particle,

wherein said ingredients are present in a combined amount effective for controlling the lengthening effect of mascara on keratinous fibers.

42. A mascara composition according to claim 41, wherein said mascara composition further comprises a plasticizer.

43. A mascara composition according to claim 41, wherein said mascara composition further comprises carbon black.

44. A method of controlling the lengthening effect of a mascara product on an eyelash comprising

applying in a layer upon layer manner to said eyelash a composition comprising

at least one polysaccharide resin,

at least one film former other than said at least one polysaccharide resin,

at least one volatile solvent, and

at least one spherical particle,

wherein said composition is applied until the desired lengthening or volume effect is achieved.

INTERNATIONAL SEARCH REPORT

Intern ıal Application No
PCT/US 00/24042

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K7/032 A61K7/06 A61K7/48

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 56333 A (L'OREAL ET AL.) 17 December 1998 (1998-12-17) cited in the application example 22	1-37, 41-44
Y	---	40
X	US 5 256 404 A (MARTINO ET AL.) 26 October 1993 (1993-10-26) column 2, line 31 - line 63 examples 1,2	38,39
Y	-----	40

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 January 2001	16/01/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Alvarez Alvarez, C

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern\ ıal Application No
PCT/US 00/24042

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9856333 A	17-12-1998	US 6015574 A	18-01-2000
		AU 8053398 A	30-12-1998
		CN 1263456 T	16-08-2000
		EP 0983041 A	08-03-2000
US 5256404 A	26-10-1993	CA 2104080 A,C	15-02-1994
		DE 69306060 D	02-01-1997
		DE 69306060 T	13-03-1997
		EP 0583756 A	23-02-1994
		JP 2088524 C	02-09-1996
		JP 6183944 A	05-07-1994
		JP 8002776 B	17-01-1996